NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

IRRIGATION CANAL OR LATERAL

(Ft.)
CODE 320

DEFINITION

A permanent channel constructed to convey irrigation water from the source of supply to one or more irrigated areas.

PURPOSE

To convey irrigation water to one or more irrigated areas.

CONDITIONS WHERE PRACTICE APPLIES

A canal or lateral and related structures are needed as an integral part of an irrigation water conveyance system.

Water supplies and irrigation deliveries for the area served are sufficient to make irrigation practical for the crops to be grown and the irrigation water application methods to be used.

CRITERIA

All planned work shall comply with all federal, state, and local laws and regulations.

Capacity requirements. The capacity of the canal or lateral shall be:

- Capable of conveying surface runoff that is allowed to enter the channel, and
- Sufficient to meet the water delivery demands of all the irrigation systems served and the estimated conveyance losses in the canal or lateral, or
- Sized to convey the available water supply in water-short areas, where water is not normally available to meet the irrigation demands.

Velocities. Design canals and laterals at velocities that are non-erosive for the material(s) through which the channel passes. If available, use local information on the velocity limits for specific soils. If local information is not available, the maximum design velocities shall not exceed those shown in Figure 6-2, Chapter 6, TR-25 "Design of Open Channels" or other equivalent methods. On unlined canals and laterals constructed with earthen materials, use Manning's "n" no greater than 0.025 to check that velocities do not exceed permissible values.

Design canals and laterals to convey safely the required flows with the maximum probable retardance conditions. For capacity design, select the value of "n" according to the material in which the canal or lateral is constructed, the alignment, the hydraulic radius, the expected vegetative growth, and planned operation and maintenance.

Freeboard. The required freeboard above the maximum design water level shall be at least one-third of the design flow depth (0.33d) and shall not be less than 0.5 feet.

Water surface elevations. Design water surface elevations with enough hydraulic head for successful operation of all ditches or other water conveyance structures diverting from the canal or lateral.

Side slopes. Design canals and laterals to have stable side slopes. Use local information on side slope limits for specific soils and/or geologic materials, if available. If local information is not available, design the side slopes for the banks of canals or laterals no steeper than shown in the Engineering Field Handbook (EFH), Section 650.1412 d.

Canal or lateral banks. Design the top width of the canal or lateral banks to ensure stability, prevent excessive seepage, and facilitate maintenance. The bank top width shall not be less than 2 feet and shall equal or exceed the maximum design water level. If the berm is to be used for a roadway, it shall be wide enough to allow safe equipment travel and operation.

Protection from surface waters. Convey runoff from adjacent areas over, under, or away from the canal, wherever practical. If runoff is permitted to enter the canal or lateral, protect the side slopes from erosion, and provide for its disposal. If sediment-laden

water is allowed to enter the canal or lateral, include provisions in the design to transport the sediment through the channel, or measures to trap and remove the sediment.

Related structures. Design the canals or laterals with adequate turnouts, checks, crossings, and other related structures needed for successful operation and maintenance of the facility. Design all structures in accordance with the applicable NRCS practice standard. Install structures needed for the prevention or control of erosion before putting the canal or lateral into operation.

Linings. On sites with moderately rapid to very rapid permeability soils, or where erosive water velocities will occur, the canals and laterals shall be lined or piped according to the appropriate NRCS Practice Standard(s) for ditch and canal linings or pipelines.

Maintenance access. Include provisions, as required, for maintenance access.

CONSIDERATIONS

When planning this practice, consider the following, as applicable:

Features needed to incorporate safety elements.

The movement of sediment, and the soluble and sediment-attached substances carried by runoff to surface waters and the movement of dissolved substances to groundwater.

Removing sediment from runoff water with buffers, filters, or sediment basins.

Effects on:

- Downstream flows or aquifers that would affect other water uses or users.
- The volume and rate of runoff, infiltration, evaporation, transpiration, deep percolation, and ground water recharge.
- Erosion on the banks and bed of the channel.
- Wetlands or water-related wildlife habitats.
- The visual quality of the soil, water and plant resources.
- Cultural resources.

PLANS AND SPECIFICATIONS

Plans and specifications for constructing irrigation canals or laterals shall describe the requirements for applying the practice to achieve its intended purposes. Site specifics typically include cross-section details, embankment/bank requirements, channel grades, and appurtenant structural details.

OPERATION AND MAINTENANCE

Before the practice is installed, provide and review a site-specific operation and maintenance plan with the landowner(s).

The plan shall adequately guide the landowner(s) in the routine maintenance and operational needs of the irrigation canal or lateral. The plan shall also include guidance on periodic inspections and post-storm inspections to detect and minimize damage to the canal or lateral.

The plan shall include requirements for the removal of accumulated sediment and debris from the channel, the repair of banks and berms, and control of undesired vegetation.